Methods: In 18 patients sp-RNA was performed after completion of routine p-RNA. Twelve patients were treated with cardiotoxic agents, 5 patients were known with a previous myocardial infarction, 1 patient was known with dilated cardiomyopathy. For sp-RNA a 3-head gamma camera was used. After filtering of data short, horizontal long and vertical long axes were reconstructed from 2 pixel thick transversal slices. SPECT EFs were assessed by applying a 35% threshold to a region containing the LV. On pl-RNA and sp-RNA studies regional wall motion (normal, hypo-, a- or dyskinesia) was visually assessed in 7 myocardial segments. For the assessment of intra- and inter observer variability sp-RNA EF measurements were performed twice by the same observer and once by a second observer.

Results: On pl-RNA wall motion abnormalities were observed in 12 segments (sgm). On a-RNA 15 sgm were considered abnormal. In 9 sgm abnormalities were considered more severe on sp-RNA than on pl-RNA. In the 12 patients treated with cardiotoxic agents no wall motion abnormalities were observed.

There was a linear relationship between pl-RNA and sp-RNA EF measurements ($y = x + 5.8$; $r = 0.83$; SEE = 8.0). The intra-, and inter-observer variabilities were 1.9% ± 2.8 and 3.2% ± 2.0% respectively.

Conclusion: sp-RNA is an accurate method for the assessment of LV function. The gain of SPECT in RNA is the improved detection of regional wall motion abnormalities.

1233-166 Dobutamine gated-SPECT, thallium-SPECT and Dobutamine Stress Echocardiography to Assess Myocardial Viability

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Aim: 1/ Accuracy of MIBI-Quantitative-Gated-SPECT (QG-SPECT) during dobutamine infusion, to assess myocardial viability determined by dobutamine stress echocardiography. 2/ Comparison of QG-SPECT data, LV volume, ejection fraction (LVEF), wall motion and thickening, with echocardiography and LV angiogram.

Methods: a double head rotated gamma camera (HELIX-ELSCINT with Cedars Sinai software) was used to perform QG-SPECT. 12 pts had myocardial viability studied by Thallium-SPECT and during dobutamine infusion (10 $\mu g.kg^{-1}.mn^{-1}$) by QG-SPECT and stress echocardiography (dobu-echo). 37 pts got QG-SPECT with echocardiography and coronary angiography.

Results: 1/ QG-SPECT overvalues basal LV volumes (diast. +12%, syst. +33%) and underrates LVEF (-20%). During dobutamine infusion, LVEF changes are well correlated with echocardiography data ($r = 0.88$). 2/ Kinetic abnormalities of LV angiograms are well detected by echocardiography (sens. 94%, spec. 87%). QG-SPECT detection accuracy is lower (sens = 92%, spec = 50%). 3/ QG -SPECT is better than thallium-SPECT to detect a myocardial viability in infarction area.

Viability diagnosis/dobu-echo	Sens.	Spec.	PPV	NPV
Basal + redistribution Tl-SPECT	25%	100%	100%	33%
Dobu-G-SPECT motion	88%	50%	78%	67%
Dobu-G-SPECT thickening	75%	75%	86%	60%

Conclusion: QG-SPECT is a quantitative automatic method. It is feasible during a dobutamine infusion. Dobutamine QG-SPECT is a new way to assess myocardial viability.

1234 Peripheral Artery Disease

Wednesday, April 1, 1998, 3:00 p.m.–5:00 p.m.
Georgia World Congress Center, West Exhibit Hall Level
Presentation Hour: 4:00 p.m.–5:00 p.m.

1234-47 Association of Accelerated Atherosclerosis and Myocardial Hypertrophy With Systemic Lupus Erythematosus

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Background: Clinical evidence of premature vascular disease (stroke and myocardial infarction) has been reported in systemic lupus erythematosus (SLE) and antiphospholipid antibody syndrome (APLA) and has been attributed to an increase in conventional atherosclerosis risk factors and/or prednisone use.

Methods: Preclinical evidence of vascular and myocardial disease was evaluated using carotid and cardiac ultrasound in 18 patients with SLE and 4 with primary APLA and compared to findings in 44 control subjects matched for age (mean = 41 years), gender (100% female) and race and to the presence of risk factors.

Results: Patients were comparable to controls in blood pressure, total and HDL cholesterol, and smoking history but tended to be obese (body mass index 29.3 vs. 25.2 kg/m^2, $p = 0.05$). Prevalence of carotid plaque was higher in patients (41 vs 9%, $p < 0.005$) as was left ventricular (LV) mass adjusted for obesity (40.3 vs 31.6 gm/m$^{2.7}$, $p < 0.005$). Furthermore there were no differences between patients with and without plaque in conventional risk factors or use of prednisone. Plaque and/or LV hypertrophy was present in 5/7 patients with clinical cardiovascular disease.

Conclusions: Preclinical cardiovascular disease is very common in SLE and APLA and is not explained by traditional risk factors or steroid use, suggesting that inflammation *per se* may be of primary importance.

1234-48 Assessing Cardiac Risk of Vascular Surgery: A Simple Bayesian Model Using Clinical Markers and Results of Preoperative Dobutamine Echocardiography

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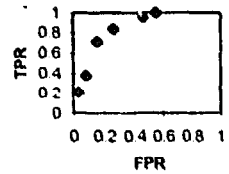
Background: We sought to validate a simple Bayesian model of assessing risk of postop cardiac death or MI in vascular surgery. We examined the use of dobutamine stress echo (DE) results to replace dipyridamole-thallium scintigraphy (DTHAL) as the diagnostic for computing a secondary risk score.

Methods: Data were collected for 340 patients (PTS) including clinical and stress test markers identified by L'Italien. A logistic model incorporated age >70 years, angina, history of MI, diabetes mellitus (DM), history of congestive heart failure (CHF) and prior revascularization to obtain clinical risk estimates. We added DE results (i.e. fixed and reversible wall motion and ST changes) to create a second logistic model. Comparison of observed and predicted estimates of cardiac events and receiver operating characteristics (ROC) curves were used to assess the models.

Results: The postop cardiac event rate was 7% (24/340). The event rate estimated from the clinical model was 5.6%; adding DE findings predicted an event rate of 7.4%. The observed event rate in PTS classified by clinical data as low (0–5%), moderate (>5–15%), or high risk (>15%) were 3.7%, 10.6%, and 14.3%. Adding DE results reclassified PTS from all categories, with the observed event rate in low, moderate or high risk PTS of 1.7%, 7.0% and 25.5%. The ROC curve (area >80%) for adverse event prediction using both models is shown indicating excellent discrimination.



Conclusion: We validated a Bayesian method for assessing cardiac risk in vascular surgery. The use of DE to replace DTHAL did not reduce the precision of the model. The clinical model is reliable in a majority of PTS; while DE can help to further refine risk prediction for specific clinical risk cohorts.

1234-49 Correlation Between pre and Intraoperative Myocardial Ischemia in Patients Undergoing Major Vascular Surgery Detected by Dobutamine Stress Echocardiography and Continuous 12-Lead Electrocardiography

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Aim of the Study: To compare myocardial ischemia detected preoperatively with dobutamine stress echocardiography (DSE) with intraoperative ischemia using continuous 12-lead ECG (Eli-100 ST) (ECG) monitoring in pts undergoing major vascular surgery.

Methods: DSE was used in 58 pts for the presence and location of stress induced ischemia (NWMA). ECG monitoring started 12 hr before up to 36 hr after surgery. In order to analyse the "ischemic burden" and location (anterior, lateral, inferior, and posterior), an algorithm was used for the detection and quantification of ischemic ST-episodes in each of the 12-leads ECG separately. Total ischemic burden was calculated as the total duration of ST-episodes (min) per pt and the summated areas (severity) under the curves of the 12-leads episodes (μV.min).

Results: ECG ischemia was preceded by a mean heart rate increment of 51%. DSE and ECG showed ischemia in 13/56 and 25/56 pts. The agreement

between DSE and ECG for the presence of ischemia was poor (43%) but excellent for location (100%). The ischemic burden of pts with and without NWA was not different, (duration of ischemia 84 vs 94 min and severity 2300 vs 1700 μV.min). Pts with NWA had significantly less severe ischemia on beta-blocker therapy (4750 vs 400 μV.min, $p < 0.01$).

Conclusions: There was a poor relation between ischemia assessed by ECG and DSE, which may indicate the importance of intraoperative haemodynamic changes (i.e. heart rate and blood pressure). Beta blockers have a protective effect for ischemia in patients with a positive DSE in this study.

1234-50 Walking Improvement Questionnaire: A Potential Standardized Instrument for Evaluating Functional Improvement After Peripheral Angioplasty

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The development of effective less invasive, percutaneous approaches to revascularization (PTA) for peripheral artery disease (PAD) may enable the threshold for intervention to be lowered from that required for higher-risk surgical treatment. Standardized tools to evaluate improvement in symptoms are needed to evaluate outcomes. The Walking Impairment Questionnaire (WIQ) is a standardized instrument developed to evaluate response to exercise conditioning in patients with claudication. To determine the utility of WIQ in measuring degree of symptomatic improvement after PTA, we administered the WIQ to 100 consecutive patients pre-PTA and at 6 months follow-up. WIQ score was correlated with ankle:brachial index (ABI).

	Pre-PTA	Post-PTA
ABI	0.68 ± 0.09	0.89 ± 0.16*
WIQ summary score		
distance	31 ± 14	73 ± 16*
speed	27 ± 15	50 ± 16*
pain	28 ± 17	46 ± 15*

*significant improvement ($P < 0.05$) versus pre-PTA)

Conclusion: This preliminary attempt to employ a validated instrument (WIQ) to objectively evaluate symptomatic improvement after PTA demonstrates excellent correlation between WIQ scores and ABI. Further refinement of this and/or other standardized instruments will be imperative to better evaluate clinical outcome after PTA.

1234-51 The Effect of Height on Vascular Events After Percutaneous Intervention

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Vascular events are a major contributor to morbidity after percutaneous intervention. Predictors for vascular complications are not well identified, but older age, increased weight, and female gender have been associated with increased risk. The influence of height has not been reported. We reviewed the clinical course of 4,214 patients who underwent percutaneous interventions performed at our institution after December 1993 to identify the influence of height on the occurrence of vascular complications. To eliminate the strong association of gender with height, male and female patient groups were compared separately.

	M-short	M-avg	M-tall	F-short	F-avg	F-tall
Hematoma%	11.7	10.0	8.9	18.7*	12.2	6.9
Limb isch.%	0.7	0.8	0.8	4.8*	1.9	1.7
AV fistula%	1.3	1.1	0.9	1.3	1.5	1.7
P.anysm%	1.5	1.6	0.9	3.5*	2.3	0.0
Ret. bleed%	0.2	0.0	0.0	0.6	0.5	0.0

*$p < 0.05$

We conclude that 1) short stature in female patients is associated with a significantly higher incidence of hematoma, limb ischemia and retroperitoneal bleeding, 2) women as a group have a higher incidence of limb ischemia than men, and 3) in male patients, height is not predictive of vascular complications. Possible explanations for these results include the use of non-weight adjusted heparin dosing during the study period or the relatively smaller femoral artery size in short female patients.

1234-52 Mechanical Thrombectomy in the Treatment of Acute Critical Limb Threatening Ischemia

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We tested the efficacy of the AngioJet catheter in acute limb threatening ischemia in 21 pts (mean age 68 ± 12 years; 66% males) and 22 vessels. Ten pts had contraindications to thrombolytic therapy and surgery. All patients had sudden onset of symptoms (mean ischemic pain: 10 ± 18 hours) and presented with limb threatening ischemia and pulseless extremity. The arteries treated included: iliac (n = 2), femoro popliteal (n = 9), brachial (n = 2) and grafts: aorto iliac (n = 1), femoro popliteal (n = 7), femoro femoral (n = 1). Lesion length was 38.5 ± 23 mm. The etiology of the acute ischemia was presumed to be thrombosis (n = 20) and embolic (n = 2). Adjuntive balloon angioplasty was performed in (95%) of the vessels. The angiographic results are described in the table:

	Pre AngioJet	Post AngioJet	Final
Vessel diameter (mm)	0	3.05 ± 1.56(*)	4.10 ± 1.58(*)
% stenosis	100%	50.99 ± 17.9(**)	30.7 ± 16.2(**)

(*) $p < 0.001$ (**) $p < 0.0001$

Procedural success defined as restoration of blood flow was accomplished in (95%) vessels. Procedure complications included distal embolization (n = 2), hematoma (n = 1). Recurrent thrombosis occurred in 4/22 (18%) of the lesions (two days [n = 2], one week [n = 1], and 1 month [n = 1] after the procedure). There were 3 hospital deaths and two late deaths (8 and 12 months after procedure) due to non vascular causes. The overall survival was 16/21 (76%) and limb loss 3/21 (14%). The rest of the pts: 13/21 (62%) were free of significant ischemic symptoms at follow up.

Conclusion: Mechanical thrombectomy using the AngioJet catheter is effective in restoring immediate blood flow in acute limb threatening ischemia especially in patients with contraindications for thrombolytic therapy or surgery.

1235 Hypertensive Heart Disease

Wednesday, April 1, 1998, 3:00 p.m.–5:00 p.m.
Georgia World Congress Center, West Exhibit Hall Level
Presentation Hour: 4:00 p.m.–5:00 p.m.

1235-65 Racial Differences in Ventricular Remodeling in Hypertensive Heart Disease: An Autopsy Study

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Morbidity and mortality rates for cardiovascular (CV) diseases are higher in blacks (B) than whites (W) with hypertension, a major contributor to excess mortality. The basis for increased risk in B with hypertension is uncertain. An adverse structural remodeling of the left ventricle (LV) by fibrillar collagen would compromise ventricular stiffness and enhance arrhythmogenic potential. This inter-institutional study compared 36 B and 29 W for: incidence of CV events including myocardial infarction (MI), stroke (CVA), chronic renal (RF) and heart (HF) failure; heart weight (HW, g/m^2), LV and RV thickness (LVT, RVT, cm); and structure of formalin fixed, postmortem (PM) LV tissue in individuals, who died of noncardiovascular causes and at PM had no evidence of significant coronary artery or valvular heart disease or cardiomyopathy. Diabetes was excluded from historical information. The presence or absence of hypertension and left ventricular hypertrophy was based on history and PM heart weight. Amongst B: 11 normotensive controls (C, 7 M, 54 ± 6 yrs) and 25 hypertensives (HT, 15 M, 59 ± 15 yrs). For W: 10 C (9 M, 58 ± 11 yrs) and 19 HT (13 M, 65 ± 14 yrs). In picrosirius red stained tissue sections, collagen volume fraction (CVF) was estimated by videodensitometry. The incidence of CVA, MI, RF and HF was higher in BHT then WHT ($p < 0.05$). RVT was similar in all 4 groups.

Groups	WC	WHT	BHT	BC
HW	195 ± 26	257 ± 58♣	288 ± 80	185 ± 56
LV	1.45 ± 0.20	1.75 ± 0.25♣	1.90 ± 0.43•	1.31 ± 0.54
CVF	1.59 ± 0.54•	3.20 ± 2.88*	5.04 ± 4.55•	2.29 ± 0.78

p value: * - 0.05, • - 0.01, ♣ - 0.001, ns not significant

BHT and WHT compared with respective controls had significantly higher HW, LVT and CVF. BHT compared with WHT had significantly higher CVF. Thus, in this retrospective study, BHT had a greater risk of adverse CV events and were found to have a greater proportion of fibrous tissue in the